

Table 4. Comparable average test weight (lbs/bu) on dryland, comparing McGuire to five other hard red winter wheat varieties (1987-1995).

Variety	Bozeman	Conrad	Havre	Huntley	Kalispell	Moccasin	Sidney	Average
McGuire	61.4	62.7	57.4	59.4	60.5	60.7	60.8	60.4
Judith	59.3	60.4	56.3	57.0	59.2	58.4	58.3	58.4
Neeley	60.9	60.9	57.2	58.3	60.0	59.9	59.9	59.5
Redwin	61.8	61.2	59.3	59.9	59.9	61.0	61.2	60.6
Rocky	62.0	62.9	58.9	59.0	59.6	60.3	61.5	60.6
Tiber	61.4	61.6	59.8	59.6	59.7	60.8	61.2	60.6

Table 5. Average milling, baking and other quality characteristics of McGuire and five other hard red winter wheat varieties.

Variety	Flour		Farinograph ¹	Baking data		
	Yield (%)	Ash (%)	Dough stability ² (in minutes)	Wheat protein (%)	Water absorption ³ (%)	Loaf volume (cc)
McGuire	67.2	0.44	3.7	14.8	65.2	1081
Judith	68.2	0.41	3.2	13.1	65.9	976
Neeley	66.6	0.44	3.6	13.0	64.5	909
Redwin	68.9	0.41	2.9	13.8	65.2	950
Rocky	67.2	0.45	4.1	13.0	64.6	873
Tiber	67.4	0.39	3.1	13.0	63.5	911

¹Machine for measuring physical dough mixing properties of wheat flour.

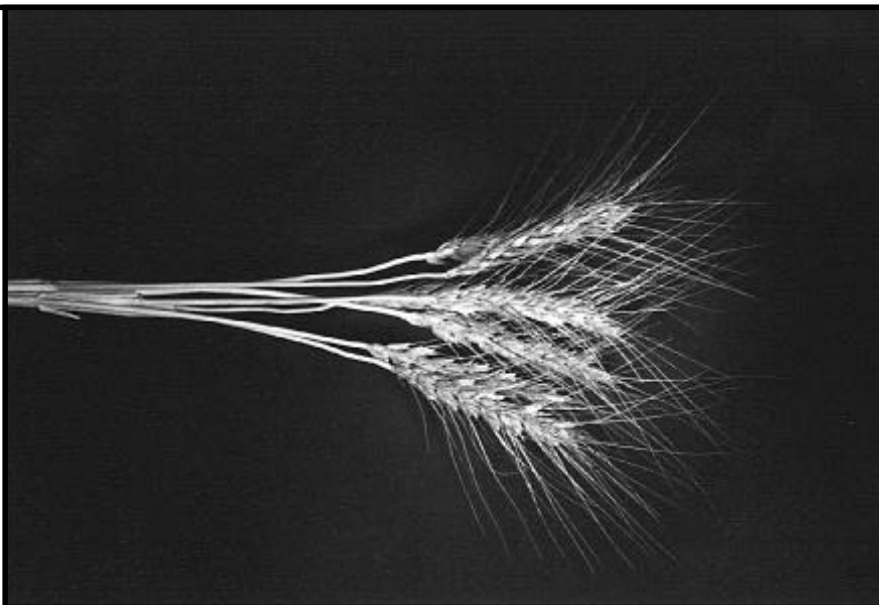
²Dough stability describes the length of time a wheat flour may be mixed before it breaks down.

³Water absorption: Bake absorption is the amount of water a flour sample requires to make a dough for optimum baking responses.

Source: MSU Cereal Quality Laboratory, Annual Report 1988-1994

The programs of the Montana State University Extension Service are available to all people regardless of race, creed, color, sex, disability or national origin. Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Andrea Pagenkopf, Vice Provost and Director, Extension Service, Montana State University, Bozeman, Montana 59717.

4201000796 MS



**McGuire
Winter
Wheat**

McGuire Winter Wheat

by Howard Bowman, Dennis Cash, Phil Bruckner and Jim Berg*

**Extension agronomist; Extension crop specialist; associate professor and research associate, winter wheat breeding/genetics, Plant, Soil and Environmental Sciences Department, Montana State University*

McGuire (PI 593890) is a hard red winter wheat developed by the Montana State University Agricultural Experiment Station. McGuire has the characteristics and potential to produce value-added, high-quality end-use wheat products. It has a very high grain protein content compared to other winter wheat varieties grown in Montana.

Origin and Development

McGuire was developed from the cross of Plainsman V//Froid/Bezostoya/3/ NE7060/Froid. It was named in honor of Charles F. McGuire, a long-time cereal chemist in the Plant, Soil and Environmental Sciences Department at Montana State University. McGuire has potential for production in organic farming. Foundation seed of McGuire was released in the fall of 1996 to certified seed producers.

Agronomic Characteristics

McGuire is an awned, bronze chaffed variety. At maturity the spikes are erect. McGuire is two inches shorter than Judith and Neeley, three inches shorter than Rocky, and four inches shorter than Redwin and Tiber. It heads two days earlier than Judith and Rocky, and five to six days earlier than Neeley, Redwin and Tiber (Table 1). It has a coleoptile length slightly longer than Rocky and Neeley. The kernels are hard, red, with a mid-sized germ and a heavy brush. Kernel cheeks are round to angular and the crease is open. The kernel back is long and sloping. The seed coat has a rough texture.

Disease and Insect Resistance

McGuire is resistant to stem rust. It is susceptible to dwarf smut, stripe rust and the wheat stem sawfly. It is susceptible to the wheat streak mosaic virus and has a moderate reaction to the leaf spot complex (Septoria and tan spot) (See Table 2).

Table 1. Agronomic comparisons of McGuire with five other hard red winter wheat varieties grown under Montana conditions.

Variety	Winter hardiness ¹	Approx. heading date (June)	Plant height (in.)	Lodging ²	Grain shatter ²
McGuire	3	7	33	MR	M
Judith	3	9	35	R	M
Neeley	3	13	35	MR	S
Redwin	3	12	37	VR	VR
Rocky	2	9	36	M	S
Tiber	3	12	37	VR	VR

¹1=non-hardy; 5=very winter hardy
²R=resistant; M=moderate; S=susceptible

Recommended Areas

McGuire was released to Montana producers based on its end use characteristics. Its protein content and milling and baking characteristics are well suited for organic production and/or value-added opportunities as a specialty high-quality wheat. However, because yield performance of McGuire is similar to Redwin, and other higher yielding cultivars are available, no recommendation was made at the time of release.

Field Performance

The grain yields of McGuire are similar to Redwin and are 13, 10, 6 and 5 percent lower than Judith, Neeley, Rocky and Tiber, respectively (Table 3). McGuire has a test weight higher than Judith and Neeley, but equal to Redwin, Rocky and Tiber when produced under the same conditions (Table 4).

Table 2. Disease and insect reaction of McGuire compared to five other hard red winter wheat varieties.¹

Variety	Sawfly	Dwarf smut	Stripe rust	Stem rust	Leaf spot complex	Wheat streak mosaic
McGuire	S	S	S	R	M	S
Judith	S	S	MR	R	R	S
Neeley	S	S	R	S	MR	MS
Redwin	S	S	M	S	S	MS
Rocky	S	S	M	R	S	MS
Tiber	S	S	M	S	MR	MR

¹S=susceptible; R=resistant; M=moderate

Table 3. Comparable average yields (bu/acre, 60 lbs/bu) on dryland, comparing McGuire to five other hard red winter wheat varieties (1987-1995).

Variety	Bozeman	Conrad	Havre	Huntley	Kalispell	Moccasin	Sidney	Average
McGuire	75.6	59.2	36.2	59.9	85.3	41.8	42.9	57.9
Judith	83.6	65.4	42.9	61.1	106.0	49.4	50.1	65.5
Neeley	77.2	68.4	42.0	58.5	102.9	51.9	49.1	64.2
Redwin	72.0	59.3	39.5	58.8	86.2	44.7	46.9	58.2
Rocky	77.1	65.1	44.0	58.3	91.3	46.5	49.7	61.7
Tiber	71.1	64.9	43.6	59.0	92.6	47.7	47.4	60.9

Quality Performance

The protein content of McGuire is high. It averages one percentage point higher than Redwin produced under 30 growing conditions across the state. McGuire mills and bakes a high quality bread flour product. It meets the milling and baking industry criteria for flour yield, water absorption levels, strong dough mixing characteristics, long mix time and dough stability. McGuire has exceptionally good loaf volume (Table 5).